# Commodore VIC 20 brings "Friendliness" to Personal Computing

Commodore International Ltd. (AMEX-CBU) introduced the world's first affordable full-featured computer in January, 1981. Since then the VIC—nicknamed "The Friendly Computer"—has taken the computing industry by storm.

The Commodore VIC 20 is a fully expandable micro-computer which connects to any television set and rivals the features of existing microcomputers selling at 4 or 5 times the price. With a suggested retail price of $299.95 (modulator and switchbox included), the VIC 20 is the lowest priced full-featured color computer on the market.

The features speak for themselves:

- — color
- — sound
- — built-in "extended" BASIC
- — full-size typewriter keyboard
- — expandable memory—5K to 32K
- — full- size typewriter keyboard
- — 66-key graphics character set
- — programmable function keys
- — plug-in program cartridges
- — Joystick/paddles/lightpen
- — low-priced peripherals
- — friendly self-teaching materials

The new VIC (Video Interface Computer) is designed to be the most user friendly computer on the market . . . friendly in price, friendly in size, friendly to use and expand and enjoy," said Commodore Chairman Irving Gould when the VIC was introduced at the Consumer Electronics Show in Las Vegas in January, 1981.

"In 1977, Commodore pioneered the personal computer industry with the world's first self-contained personal computer . . . the PET . . . then we expanded the PET into a business system . . . the CBM. Now, we're introducing an entirely new generation of personal computers which anyone can afford to buy, to learn on and apply . . . from first-time computerists to experienced hobbyists."

"With the VIC 20 we—Commodore—are providing a computer system which helps almost anyone get involved in computing quickly and easily . . . enough built-in expansion features to let the system "grow" with the user as his knowledge and requirements become more sophisticated."

He added that Commodore plans to market a full line of low-priced VIC 20 accessories, including: cassette recorder, single disk drive, dot matrix printer, RS232 modem/printer interfaces, 3K-8K-16K memory expansion cartridges, memory expansion module, game controls, modem, and an IEEE-488 interface for using PET/CBM peripherals on the VIC.

Most of these peripherals will be available by Christmas.



# HOW TO TELL A GAME MACHINE FROM A TRUE COMPUTER

There are lots of game machines on the market . . . devices that let you play arcade-style games on your television set . . . but why buy a game machine when you can buy a personal computer for the same price?

The VIC 20 lets you plug in the same exciting cartridges available on most game machines . . . but the VIC is a full featured *computer* and that makes a big difference.

To find out whether you're buying a game machine or a computer, . . simply ask the salesperson if the device you're evaluating has these features:

- Does it have a full size typewriter keyboard? (Some game machines try to pass themselves off as computers by including flat plastic keypads or calculator keys that look okay but are difficult to use . . . so be careful!)
- Can you use all 3 types of storage media: plug-in program cartridges, cassette tapes, AND floppy disks? (Many game machines offer a cassette recorder and tapes but do NOT offer a disk drive)
- Is full-power BASIC built-in or do you have to pay extra for an "extended" computing language? (The VIC 20 has full BASIC built into its operating system)
- Is a self-teaching instruction book included or do you have to pay extra for it? (If there's no instruction book the chances are you're not buying a real computer. The VIC includes a free "friendly computer guide.")

The advantages of owning a personal computer instead of a game machine are obvious. Make sure you make the right decision before you buy.

# "Yes, but what can I do with it?"

We are entering an era where computers will be as widespread as automobiles and television sets. Not knowing how to use a computer will be like not knowing how to drive a car. We like to say that "not having a Commodore computer is like not having a telephone"—that's how certain we are that computers will soon reach the status of a home and office "appliance."

As a truly "personal" computer, the VIC fits comfortably into all environments—home, school and office—but to give you a better idea of what the VIC "does," here are some specific examples:

## Teach Yourself Computing

You don't have to be a computer programmer, or even a typist, to use a computer but it helps to have a working knowledge of what a computer is and what it can do for you.

One of the most obvious uses for the VIC is to teach yourself computing. Commodore has developed some innovative self-teaching materials to help you learn about your VIC, and about computing in general.

## Games and Recreation

It would be foolish not to recognize that personal computers are—in addition to their utilitarian uses—the most powerful "game devices" yet devised. There are hundreds of computerized arcade games which take you on exciting intergalactic journeys, and many of these games will be made available for the VIC 20, on easy-to-use plug-in cartridges.

One of these games is called "Avenger," and is similar to some of the computer games found in many arcades. Sargon II Chess will also be provided—adapted from what may be the most powerful chess game available on microcomputers. Truly challenging! Additional games include such standards as bridge, backgammon, etc.

## Educational Applications

It is anticipated that the VIC will follow in the footsteps of its big brother, the Commodore PET—the world's most widely used educational microcomputer. The VIC will undoubtedly be used by students both in and outside the classroom.

Students who've been using the PET in their classroom will find that their programming skills translate directly to the VIC 20, which uses the same programming language as the PET (with the addition of color and sound!), and incorporates the same famous "PET graphics" characters.

Given the lower price of the VIC, teachers will find that they can put more computers on student desks . . . and elementary and intermediate grade teachers will find that budgets which couldn't accomodate higher-priced computers can now include the VIC.

## Personal Computing in the Home

One of the first "home" computer programs to become available for the VIC is a home tax preparation system. This easy-to-use system will include a special plug-in cartridge which asks you a variety of questions and prepares your current federal tax returns based on the answers.

Home budgeting is another area which will be addressed. By entering your monthly expenses and allowances into the home budget system, you can accurately determine what your future savings will be, how much you will have for "emergencies," even whether you can afford that new car or vacation next year, and when!

Several other home application cartridges are currently being developed by Commodore and will be announced as they are tested and made available. It is Commodore's intention to concentrate on practical home applications which take full advantage of the VIC's computing power and convenience, with special emphasis on programs which help fight inflation, conserve energy and provide more time and convenience for the user.

## Computerized Energy Control

Commodore entered the energy electronics field during Fall 1980 with a unique electronic programmable thermostat which regulates heating and air conditioning temperatures for a savings of up to 30% in home and office fuel costs.

It is expected that Commodore's continuing emphasis on energy control electronics will result in adaptations for the VIC which allow the user to "computerize" such things as lighting and temperature control and other aspects of home energy consumption which can result in significant cost savings.

## Telecommunications

One of the VIC's most powerful features is its ability to use any television set as its "computer screen." If we take this marriage of technologies one step farther, we can attach the VIC to a telephone via a modem (a device for translating computer signals into telephone signals and vice-veras) and tie in our computer to a telecomputing service.

Wouldn't it also be nice to be able to call up a local telephone number and get a rundown on all your current stock market investments, and punch up individual news stories on the companies you've invested in? This service is being made available by several telecomputing services including the source.

## Business Applications

The VIC's full-size typewriter keyboard, special screen editing keys and lowcost peripherals will undoubtedly result in the computer being used by small businessmen, primarily as an intelligent terminal but quite probably in more creative roles as well.

For example, the VIC is compact enough to fit snugly into a briefcase. A salesman might carry a VIC with him on the road, record data as he travels and report the results back to his home office through his computer, over the telephone.

The VIC might be taken to the site of a disaster to help record statistics for emergency and relief purposes.

## The Future of the VIC

What specifically can you do with the VIC 20? How will it improve your lifestyle, or save you money, or contribute to your welfare and convenience? There isn't room in this article to cover all the possibilities. All we can do is make it available with as many suggestions as possible, and let you adapt the computer to your own needs—you may even invent some new applications of your own!
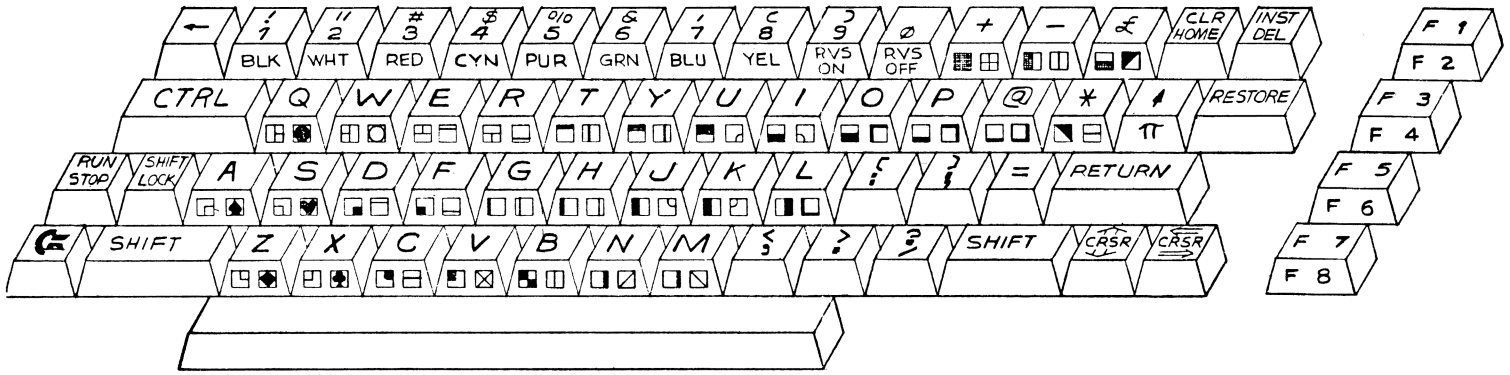
# A Tour of the VIC 20 Keyboard

It's difficult to convey in a one dimensional publication just how powerful a 3 dimensional computer can be, but a good way to get to know the VIC 20 personal computer is to take a quick tour of the keyboard.

The keyboard contains upper and lower case keys, numbers and symbols, just like a typewriter keyboard. In addition, there are special editing keys, and the famous "PET GRAPHICS" character set. Here then, is a brief "tour" of the VIC keyboard:

**GRAPHICS & THE COMMODORE KEY** — When you turn on the VIC, you're automatically in "graphics" mode which means you can type upper case letters AND the more than 60 graphics you see on the keys. There are two graphics on each key. To get the graphic on the right side, simply hold down the SHIFT key and type the key with the graphic you want. To get the graphics on the left side, hold down the "COMMODORE" key (the little flag). In this way, you can type upper case letters and the full graphics set at the same time!

**UPPER/LOWER CASE & GRAPHICS** — To get into the "text" mode you simply press the SHIFT and COMMODORE keys together. This lets you use the VIC like an ordinary typewriter, with full upper and lower case letters, plus all the graphics on the LEFT side of the keys. These are the graphics which are most suited for charts, graphs and business forms.

**COLOR** — You can change the colors of the characters you type by pressing the CTRL key and one of the 8 color/number keys. The colors are

black, white, red, cyan, purple, green, blue and yellow. You can set — and change — colors inside or outside a computer program. In addition to the eight character colors, you can also change the colors of the BORDER and SCREEN on your television set, by typing a special command called a "POKE." For example, if you type the command POKE 36879,X where X is some number from 1 to 255, you can get up to 255 different combinations of screen and border colors, including 16 screen colors and 8 border colors.

**SPECIAL EDITING KEYS** — Here are some of the other special keys which make the VIC such a powerful microcomputer:

**CTRL** — used to set character colors, and, in conjunction with special programs such as wordprocessing, to execute special commands.
Software writers can select their own "Control" commands and incorporate them into their programs.

**RUN/STOP** — The RUN/STOP key lets you automatically load programs into the VIC's memory from a cassette tape. Hitting this key without shifting (i.e. STOP) interrupts a running program or listing. If you stop a program and want to resume it where you left off, you can type "CONT" and the program will "continue."

**SHIFT** — The VIC has two SHIFT keys and a SHIFT LOCK key, just like a typewriter, for typing long strings of upper case letters or graphics.

**RVS ON and RVS OFF** — These two keys let you type reverse characters on the screen (for instance

white on black instead of black on white).

**CLR/HOME** — This key makes the cursor move to the "home" position at the top lefthand corner of the screen. If you type SHIFT and CLR/HOME you "clear" the screen of all the characters that were present.

**INST/DEL** — This is a super editing key which lets you insert or (shifted) delete characters. It's great for correcting mistakes and inserting extra information.

**RESTORE** — This is a "reset" key. If you type the RUN/STOP key and the RESTORE key together, you completely reset the computer as if you just turned it on . . . with the benefit that any programs you had in the memory are retained and can be listed or run from the start.

**CURSOR KEYS** — Ability to move the screen cursor up and down and sideways by hitting single keys is a powerful feature of the VIC. Being able to move the cursor this easily is essential but not all computers include it as a feature.

**RETURN** — The RETURN key is used primarily for entering commands and instructions to the computer.

**PROGRAMMABLE FUNCTION KEYS** — One of the most unique features on the VIC is that mysterious vertical row of "function" keys on the far right side of the keyboard. There are four keys and (if you shift them) a total of eight functions. These keys can be sensed under program control, or assigned special functions used with plug-in cartridges.

# VIC accepts tape, disk and plug-in cartridge

There are three ways to store data on the VIC 20: tape, disk and cartridge. In other words, the VIC 20 may be used with the same computer storage media as most larger computers.

## Working With Tape

The VIC comes equipped with a tape cassette interface which lets you plug a Commodore cassette tape unit directly into the computer. A new lower-priced VIC cassette unit is now available, although the existing cassette unit which works with the PET/CBM can also be used with the VIC.

To demonstrate how easy it is to load and retrieve data on tape, you simply insert a standard tape cassette cartridge into your tape unit. If you have a program in the computer which you would like to "save," you simply type: SAVE "NAME OF PROGRAM". The screen will display: "PRESS RECORD & PLAY ON TAPE PLAYER" then, while the cassette unit is recording, it will show, "OKAY. SAVING (NAME OF PROGRAM)" on the screen. When it is done saving the program it will print: "READY" so you know it's done.

Thus, the VIC has a "brain" to help you along when you want to conduct a simple operation like saving a computer program you've written. Once a program is saved on tape . . . or if you buy a program already provided on tape . . . you can "LOAD" the taped program back into the computer by typing "LOAD" and hitting the RETURN key.

## Working With Disk

Most computer owners find they prefer working with computer disks because disks are much "faster" than tapes and can store more data.

Commodore will introduce a low-priced single floppy disk unit with 170 kilobytes of memory (for reference purposes one byte may be thought of as one character or space, so 170K means 170,000 characters of storage).

PET owners may write programs for the VIC on disk and run the disk in the VIC disk drive (recognizing that the programs must conform to the VIC's 22 character × 23 line screen format).

The VIC will also be able to use PET/CBM peripherals through a special IEEE interface card which will be provided as an accessory. This accessory will allow PET owners to use the same IEEE PET/CBM peripherals for both PET and VIC products.

## Working With Cartridge

One of the unique features of the VIC is its ability to access programs on a plug-in cartridge. This cartridge might contain a game or instructional lesson . . . or it might contain a program into which you can feed data, get results . . . and then "save" those results on tape or disk.

The combination of cartridge based programs with tape or disk is especially powerful because it allows you to store large amounts of data on disk and change or process that data using the cartridge.

It is anticipated that two types of cartridges will develop . . . auto-starting cartridges which activate as soon as they are plugged in, and cartridges which must be "turned on" using some sort of access command.

## Storing Data

These methods of storing and retrieving data allow the VIC user to purchase existing software in a variety of standard formats, to create his or her own programs and store them, and to take advantage of the VIC's powerful cartridge option. This flexibility makes the VIC suitable for use by all levels of computerists, from novices to experienced programmers.

# Personal Computer Comparison Chart

| Product Features | Commodore VIC 20 | Atari 400 | TI 99/4A | TRS-80 Color Computer |
|---|---|---|---|---|
| Price* | **$299.95** | $399.95 | $525.00 | $399.50 |
| Total Memory Standard | **25K** | 26K | 42K | 12K |
| Memory (RAM) | **5K** | 16K | 16K | 4K |
| Memory (RAM) Expansion to | **32K** | Not Available | Not Available | 32K |
| Keyboard Style | **Full-Size Typewriter-Style** | Flat Plastic Membrane | Half-size Typewriter-Style | Calculator-Style |
| Number of Keys | **66** | 57 | 40 | 53 |
| Programmable Function Keys | **4** | 0 | 0 | 0 |
| Graphic Symbols on Keyboard | **62** | 0 | 0 | 0 |
| Displayable Characters | **512** | 256 | 64 | 256 |
| Basic Language | **Microsoft Basic** | $59.95 Extra | TI Basic | Radio Shack Basic |
| Microprocessor | **6502** | 6502 | TI 9900 | 6809 |
| TV & Monitor Connections | **Standard** | TV Only | TV $49.95 Extra | TV Only |
| Accessible Machine Language | **Yes** | Yes | No | Yes |
| Color & Sound | **Yes** | Yes | Yes | Yes |
| Upper/Lower Case Characters | **Yes** | Yes | No | No |
| Operates with all Peripherals (Disk, Printer & Modem) | **Yes** | No | Yes | Yes |
| Full Screen Editor | **Yes** | Yes | No | No |
| English Language Screen Messages | **Yes** | No | Yes | Yes |
| Micro Soft Basic | **Standard** | N/A | N/A | $99.00 |
| RS232 Interface | **$49.95** | $219.95 | $225.00 | $19.95 |
| Data Cassette | **$75.00** | $89.95e | $89.95e | $59.95 |
| Telephone Modem with Interface | **$110.00 (Jan.)** | $399.95 | $450.00 | $154.95 |
| Self-Teaching Computer Guide | **Standard** | $5.95 | Standard | Standard |
| Price Comparison of Complete Computer & Major Accessories | **$559.90** | $1175.70 | $1339.90 | $727.85 |

*Manufacturers suggested retail price Sept. 1, 1981.
e-estimated

# Innovative Software makes the VIC "Compute"

One of the keys to any computer is its software . . . the pre-recorded programs you buy on cartridge, tape cassette or diskettes which actually make the computer "compute." The Commodore VIC 20 comes with a wide selection of programs, primarily on plug-in cartridge and tape cassette.

Plug-in program cartridges for the VIC start at $24.95 and are available at most computer retail centers and fine quality department stores. Programs on cassette tape, for use with the Commodore DATASSETTE recorder (see page 4) are available individually at a suggested retail price of $14.95 each, or may be purchased in VARIETY SIX-PACKS for $59.95 (a $90 value). Programs will be available on floppy diskettes during early 1982, after the Commodore VIC Disk Drive is introduced.

To help you find specific programs quickly and easily, Commodore has divided its software into 5 categories and color-coded the packaging using the following scheme:

| | |
|---|---|
| RED: | Games and Recreation |
| BLUE: | Education |
| GREEN: | Business & Calculation |
| BLACK: | Computing Aids |
| ORANGE: | Home Utility |

If you're shopping for VIC software at your computer or department store, you can find the category you need by checking the color of the label on the box. For example, VIC game cartridges are identified with a prominent red color bar or red lettering and VIC recreational cassette tapes have a red label.

## Recreation & Game Programs

Here is a list of entertainment programs which are available now, or soon to be available for the VIC 20:
- VIC Avenger (cartridge)
- Night Driver (cartridge)
- Jupiter Lander (cartridge)
- Draw Poker (cartridge)
- Superslot (cartridge)
- VIC Alien (cartridge)
- Rat Race (cartridge)
- Sargon Chess (cartridge)
- 5 Adventure Games (cartridge)
- Recreational 6-Pack-A (tapes)
  - Car Chase
  - Biorhythm/Compatibility
  - Blue Meanies From Outer Space
  - Slither/Super Slither
  - VIC 21 (Casino Blackjack)
  - Spacemath

## Educational Programs

In addition to the following abbreviated list of educational programs for the VIC, educational programs are available from Microphys, Computer Mania, Creative Software Inc. and other educational software companies:
- Math Games I (cartridge)
- Education 6-Pack-B (Math Improvement tapes gr. 1-6)
- Super Spacemath
- Addition Teacher
- Fraction Darts
- Tic-Tac-VIC
- Guess-plot
- Action Algebra

## Business & Calculation

The following scheduled programs are geared to using the VIC as a wordprocessor, computer terminal (with modem), calculator and decision-maker:
- VICWriter I (wordprocessing cartridge)
- VICTerm (modem terminal program on tape)
- Business 6-Pack—C (tapes)
  - Personal Finance I
  - Personal Finance II
  - Expense Calendar
  - Loan Mortgage Calculator
  - Mortgage Analyzer
  - Home Inventory

## Home Utility

The first programs to be released strictly for home use will include:
- VIC Home Babysitter (cartridge)
- BRIDGE Teach and Play (cartridge)
- Home Calculation 6 Pack-C

## Computing Aids

These programs are designed to help programmers learn programming, write better programs and/or increase the computing power of the VIC:
- VIC Programmers Aid (cartridge)
- VIC Super Expander (cartridge)
- VICMon Machine Language Monitor (cartridge)
- Programmable Character Set/ Gamegraphics Editor (tape)
- Teach Yourself Programming (a 5-part series of tapes and books ranging from BASIC to MACHINE CODE)

These are a selection of the programs scheduled for release between October 1981 and February 1982. Additional programs will be introduced during the coming months, including challenging strategy games. more arcade-style action games, and a variety of practical programs for use in schools, offices and the home.

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## How to write Software for the VIC 20

Commodore is moving forward quickly with plans to develop, produce and manufacture cartridge-based software.

Toward this goal, the company is seeking superior programs for the VIC which fall into the following categories: games & recreation, home utility, education, and business.

All software and proposals submitted for consideration will be held in strict confidence. Programs may be submitted on tape or disk to run on the PET or CBM, for evaluation purposes (especially existing programs proposed for adaptation to VIC). All programs should bear appropriate copyright notice and the author's address and phone number.

Some examples of programs evaluated or accepted to date include: tax preparation, wordprocessing, chess, and information management.

Hardware proposals are also being accepted, particularly in relation to videodisk and energy control technologies.

Cartridge-based programs accepted by Commodore will be purchased or licensed and produced and sold through Commodore's worldwide marketing organization.

All inquiries should be addressed to: VIC Software Director, VIC Product Group, Commodore Business Machines Inc., 681 Moore Road, King of Prussia, PA 19406.

# VIC 20 Instruction Guide Lets you Write Your First Program in 15 Minutes!

One of the best things about the Commodore VIC 20 is the FREE instruction guide included with each computer. This book is recognized by most authorities as the "friendliest" computing guide in the industry. With this book, you can start writing a simple computer program within 15 minutes!

After the first chapter, which gets you started, you can turn to ANY CHAPTER in the book and start with the subject that interest you most, from SOUND AND MUSIC to ANIMATION. Every chapter starts out fresh and includes immediate examples you can type in on the keyboard. No computer experience is necessary . . . you don't even have to know how to type.

The philosophy behind the VIC manual is this: you don't have to know how to repair a car in order to drive it. Likewise, you don't have to be an engineer to use the VIC 20. The owner's manual teaches you how to "drive" the VIC in clear and simple language, and lets you take any road you wish to follow.

In addition, the book's innovative appendix includes information for experienced programmers as well as first-time users.

# How the VIC was born

IN 1977, Commodore introduced the first self-contained personal computer (the PET). In late 1980, Commodore introduced the first color computer priced under $325. Both developments were made possible by the company's unique position as a vertically integrated multinational organization.

Vertical integration means that Commodore makes its own computers "from the ground up." That includes everything from design through engineering and production. Most significantly, Commodore designs and manufactures its own semiconductor chips . . . the computer's "brain."

It is no accident that both the PET and VIC were made possible by the development of proprietary semiconductor devices. In 1977, the PET was created around the 6502 microprocessor chip developed by Commodore's MOS Technology subsidiary in Valley Forge, Pa. Since then, MOS Technology's "computer on a chip" has become a standard in the microcomputer industry and is in fact used in several other microcomputers.

In 1980, MOS chip designers developed the Video Interface Chip (VIC), which provides the necessary interface between the computer and television set. The Video Interface Chip in turn gave rise to the "Video Interface Computer," although the "story of the VIC" is actually much more complex.

The real story dates back nearly 20 years, to when Commodore was marketing electromechanical calculators. Jack Tramiel, the founder and chief executive officer of Commodore, was among the first to recognize the need for a low-priced electronic hand-held calculator. The first low-priced Commodore calculators were consequently introduced several weeks before Texas Instruments entered the market and broke what had been a very high price barrier. Commodore went to Europe with its calculators and

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*"The Japanese are coming, so we will become the Japanese."*
**— Jack Tramiel**

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became the best-selling hand-held calculators on that continent.

Out of these early marketing experiences—and Commodore was and still is primarily a marketing company—Jack Tramiel resolved to vertically integrate Commodore so the company could exert stronger controls over its internal product development and pricing, and therefore meet a larger goal—to bring superior low-priced consumer electronics products to the world marketplace.

Commodore started moving toward the VIC more than 18 months ago. In the spring of 1980, Tramiel formally announced his intention to develop and market a computer priced under $300. More than a few thought the new product was premature, or unnecessary . . . but Tramiel insisted, noting that several Japanese computer companies were already poised to enter the U.S. market with low-priced computers.

He said: "The Japanese are coming, so we will become the Japanese."

He was right. The Japanese were poised to assault the U.S. marketplace just as they attacked—and captured—the automobile and television markets.

To show the Japanese what they'd be coming up against, and to test market the new VIC (Video Interface Computer), Commodore introduced the product in Japan first, in mid-September . . . choosing purposely to "carry coals to Newcastle." The thinking was, if you want to find out how good a grade of coal is, you go to the experts . . . at Newcastle where coal is mined. If you want to find out how good a computer is, you go to the toughest consumer electronics market in the world . . . Japan.

The results were impressive. Orders for over 1,000 VIC's were taken the first day the computer was demonstrated at Seibu Department Store in downtown Tokyo. Commodore's subsidiary in Japan started producing Japanese VIC's with Katakana/English keyboards, at the company's new plant in Osaka.

The VIC will be manufactured in the United States during the first calendar quarter of 1981.

# Questions and Answers about the VIC

**What does VIC stand for?**
VIC stands for "Video Interface Computer." It derives from the "Video Interface Chip" developed by Commodore's MOS Technology semiconductor subsidiary. The VIC is designated VIC 20 in the U.S. and VIC 1001 in Japan. In Germany we call it the VC20 (VolksComputer).

**What peripherals and accessories will be available with the VIC and when will they be on sale?**
Commodore will introduce a full line of accessories and peripherals which will make the VIC computer a total low-priced "system." A list of peripherals is included on page 4 of this publication. Most of these items will be available during late 1981.

**Do I have to buy anything "extra" with my VIC?**
You can start using your VIC immediately. The user's manual which accompanies the computer contains several sample programs to try, and instructional material to help you get started. The next step is to purchase Volume 1 of the Commodore Learning Series, which includes a book and plug-in cartridge which "introduce" you to computing on the VIC. Additional cartridges are available, and as you get further into computing you will undoubtedly want to acquire a tape cassette unit or disk drive to store programs and data, and perhaps a paper printer. A Programmer's Reference Guide will also be published during July.

**Where can I buy a VIC and how soon?**
VIC's are sold through authorized Commodore computer dealers and selected retail stores. VIC's became available in quantity during May-July 1981, with most peripherals available by late Fall.

**What kind of warranty comes with the VIC?**
A 90 day over the counter exchange warranty is provided—in other words, if the VIC fails to operate due to a factory defect within the first 90 days of purchase, you can return the VIC to your dealer for an over the counter exchange.

**How do I get my VIC repaired beyond the warranty period?**
Your VIC can be repaired by a Commodore computer dealer or authorized service center. Commodore is in the process of setting up a national service organization which will provide ongoing service for the VIC.

**Is the VIC compatible with the PET/CBM?**
Software for the VIC may be written on the PET/CBM, in BASIC or machine code, and transferred to the VIC via tape or disk. However, VIC programs written on the PET/CBM must conform to the VIC's 22 character screen width and cannot exceed the VIC's available RAM memory. PET lines longer than 22 characters will "wrap" around and not produce the same image on the VIC. The VIC may be used to write 40 and 80 column programs for the PET/CBM if color, sound and other commands unique to the VIC are avoided.

In terms of peripherals, the VIC, PET and CBM all use the same tape cassette so tapes are transferable. PET/CBM disk drives and printers may be used with the VIC if an IEEE interface cartridge is attached to the VIC. A low-priced single disk drive unit will be made available for use with the VIC, and a low-priced dot matrix printer is also available.

**Do I need an RF Modulator or other device to connect the VIC to my TV?**
Units come with an RF modulator included. An external power supply and video cable are also included.

**Can the VIC be used with a modem?**
An RS232C interface is built into the VIC, which enables the computer to be used for telecommunications purposes, using a Commodore "RS232C Interface Cartridge," and an RS232 modem. Commodore will introduce a "VIC Modem" in early 1982.

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**U.S. and CANADIAN SALES OFFICES**

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